CLAIMS:

1. A method of encoding an audio signal (x), the method comprising, for each of a plurality of segments of the signal, the steps of:

analysing (TSA) the sampled signal values to provide one or more sinusoidal codes (Cs) corresponding to respective sinusoidal components of the audio signal;

subtracting a signal corresponding to said sinusoidal components from said audio signal to provide a first residual signal (r_1);

modelling (SE) the frequency spectrum of the first residual signal (r_1) by determining first filter parameters (Ps) of a filter which has a frequency response approximating a frequency spectrum of the first residual signal;

subtracting a signal corresponding to said first filter parameters from the first residual signal to provide a second residual signal (r_2);

modelling (RPE) a component (r_2,r_3) of the second residual signal with a pulse train coder (RPE) to provide respective pulse train parameters (L_0); and

generating (15) an encoded audio stream (AS) including said sinusoidal codes (Cs), said first filter parameters (Ps) and said pulse train parameters (L_0).

2. A method as claimed in claim 1 further comprising the steps of:

modelling (TE) the temporal envelope of each second residual signal by determining second parameters (P_t), and

providing a third residual signal (r_3) by removing from the second residual signal the temporal envelope corresponding to said second parameters;

wherein said component of the second residual signal comprises a respective third residual signal (r_3) and

wherein said generating step includes said second parameters in said encoded audio stream (AS).

3. A method as claimed in claim 1 further comprising the step of:

modelling (TEG) the temporal envelope of the second residual signal by determining second parameters (P_T), and

wherein said component of each second residual signal comprises said second residual signal (r_2); and

wherein said generating step includes said second parameters in said encoded audio stream (AS).

4. A method as claimed in claims 2 or 3 further comprising the step of:

estimating a difference between a signal corresponding to said pulse train parameters and said component (r_2,r_3) of each second residual signal; and

wherein said generating step includes an indicator of said difference (g) in said encoded audio stream (AS).

5. A method as claimed in claim 1 wherein said pulse train coder is one of a regular pulse excitation (RPE) coder; a multiple-pulse excitation (MPE) coder; or an ACELP coder.

6. A method as claimed in claim 1 wherein said first filter parameters (Ps) comprise one of: Laguerre or Linear Prediction filter parameters.

7. A method as claimed in claim 2 or 3 wherein said second parameters (P_T) comprise one of: Linear Prediction parameters or Line Spectral Pairs (LSP) or Line Spectral Frequencies (LSF) coefficients together with respective gains.

8. A method as claimed in claim 1 wherein said method comprises the step of:

estimating (TSA) a position of a transient signal component in the audio signal;

matching a shape function having shape parameters and a position parameter to said transient signal; and

including (15) the position and shape parameters describing the shape function in said audio stream (AS).

9. A method as claimed in claim 1 wherein the number of said sinusoidal components is limited by a first bit rate budget (B), wherein said pulse train coder is limited to producing said pulse train parameters (L_0) within a second bit rate budget, and wherein the

sum of said first and second bit rate budgets is selected from a range according to a required quality of encoding.

10. Method of decoding an audio stream, the method comprising the steps of:

reading (DeM) an encoded audio stream (AS') including, for each of a plurality of segments of an audio signal: sinusoidal codes (CS), pulse train parameters (L_0), and first filter parameters (Ps); and

employing (SiS) said sinusoidal codes to synthesize respective sinusoidal components of the audio signal;

employing (PTG) said pulse train parameters (L_0) to generate an excitation signal;

imposing (SEG) a spectral envelope according to said first filter parameters (Ps) on a first signal (r_2') a component of which comprises said excitation signal, and

adding said synthesized sinusoidal components and said spectrally filtered signal to produce a synthesized audio signal ($\hat{x}$).

11. A method according to claim 10 wherein said encoded audio stream includes second parameters (P_T), said method comprising the step of:

imposing (TEG) a temporal envelope according to said second filter parameters (P_T) on a second signal (r_3') a component of which comprises said excitation signal, and

wherein said first signal comprises said temporally filtered signal (r_2').

12. A method according to claim 11 further comprising the steps of:

generating (WNG) a white noise signal; and

adding said white noise signal to said excitation signal to provide said second signal (r_3').

13. A method according to claim 12 further comprising:

high-pass filtering (We) said white noise signal.

14. A method according to claim 12 wherein a gain (g) to be applied to said white noise signal is read from said audio stream.

15. A method according to claim 10 wherein said encoded audio stream includes second filter parameters (P_T), the method comprising the step of:

imposing (TEG) a time domain envelope according to said second filter parameters (Ps) on said excitation signal, and

wherein said spectral envelope is imposed on said temporally filtered signal (r_2').

16. A method according to claim 10 wherein said encoded audio stream includes second filter parameters (P_T), the method comprising the steps of:

generating (WNG) a white noise signal;

imposing (TEG) a time domain envelope according to said second filter parameters (Ps) on the white noise signal, and

mixing said temporally filtered white noise signal with said excitation signal to provide said second signal (r_2');

wherein said spectral envelope is imposed on said second signal (r_2').

17. A method according to claim 16 wherein said mixing step comprises spectrally weighting said temporally filtered white noise signal and said excitation signal.

18. Audio coder arranged to process a respective set of sampled signal values for each of a plurality of sequential segments of an audio signal (x), said coder comprising:

an analyser (TSA) arranged to analyse the sampled signal values to provide one or more sinusoidal codes (Cs) corresponding to respective sinusoidal components of the audio signal;

a subtractor arranged to subtract a signal corresponding to said sinusoidal components from said audio signal to provide a first residual signal (r_1);

a modeller (SEG) arranged to model the frequency spectrum of the first residual signal (r_1) by determining first filter parameters (Ps) of a filter which has a frequency response approximating a frequency spectrum of the first residual signal;

a subtractor arranged to subtract a signal corresponding to said first filter parameters from the first residual signal to provide a second residual signal (r_2);

a modeller (RPE) arranged to model a component (r_2,r_3) of the second residual signal with a pulse train coder (RPE) to provide respective pulse train parameters (L_0); and

a bit stream generator (15) for generating an encoded audio stream (AS) including said sinusoidal codes (Cs), said first filter parameters (Ps) and said pulse train parameters (L_0).

19. Audio player, comprising:

means for reading (DeM) an encoded audio stream (AS') including, for each of a plurality of segments of an audio signal: sinusoidal codes (CS), pulse train parameters (L_0), and first filter parameters (Ps); and

a synthesizer (SiS) arranged to employ said sinusoidal codes to synthesize respective sinusoidal components of the audio signal;

means (PTG) for generating an excitation signal from said pulse train parameters (L_0);

means for imposing (SEG) a spectral envelope according to said first filter parameters (Ps) on a first signal (r_2') a component of which comprises said excitation signal, and

an adder for adding said synthesized sinusoidal components and said spectrally filtered signal to produce a synthesized audio signal ($\hat{x}$).

20. Audio system comprising an audio coder as claimed in claim 18 and an audio player as claimed in claim 19.

21. Audio stream (AS) comprising sinusoidal codes (Cs) corresponding to respective sinusoidal components of an audio signal (x); first filter parameters (Ps) for a filter which has a frequency response approximating a frequency spectrum of a first residual signal, said first residual signal corresponding to said audio signal with a signal corresponding to said sinusoidal components subtracted; and pulse train parameters (L_0) modelled from a component (r_2,r_3) of a second residual signal, said second residual signal corresponding to first residual signal with a signal corresponding to said first filter parameters subtracted.

22. Storage medium on which an audio stream (AS) as claimed in claim 21 has been stored.